CLAIMS

1. A method of base station change, the base station transferring packet switched communications between a mobile station and a support node, the method characterized in that the base station change is of lossless type allowing lossless base station change of packet switched communications in unacknowledged mode between the mobile station and the support node.

2. The method according to claim 1 characterized in that a protocol entity maintains N-PDU send and receive sequence numbers, and GTP T-PDU uplink and downlink sequence numbers for each packet flow subject to base station change of lossless type, the support node acting as source support node during the base station change, forwarding maintained sequence number information to a target support node of the base station change.

3. The method according to claim 2 characterized in that downlink N-PDU and downlink GTP T-PDU sequence numbers are provided along with each N-PDU forwarded from the source support node to the target support node.

4. The method according to claim 2 characterized in that LLC data buffered in source BSS that has not been sent to, or acknowledged by, the mobile station at the point in time when the source BSS sends the PS handover command message to the mobile station is deleted.

5. The method according to claim 4 characterized in that a status message is sent back to the source support node telling it how many LLC PDUs have been deteted.

6. The method according to claim 5 characterized in that the status message provides part of the one or more deleted LLC PDUs.

7. The method according to claim 6 characterized in that the status message provides the header of the one or more deleted LLC PDUs.

8. The method according to claim 2 characterized in that a set of N-PDUs sent down to the source BSS are buffered in the support node for each packet flow subject to lossless PS handover.

9. The method according to claim 2 characterized in that a PS handover command message contains an RLC ACK/NACK report allowing a mobile station to determine which one or more N-PDUs have been completely received by the network.

10. The method according to claim 2 characterized in that a mobile station starts uplink transmission upon handover to a target cell, by an estimated next uplink N-PDU that was not acknowledged by lower layers in a source cell from which the mobile station was handed over to the target cell.

11. The method according to claim 2 characterized in that a PS handover command sent from the support node to a source BSS includes expected Receive N-PDU sequence number, at which a mobile station should start transmission in a target cell for each uplink packet flow subject to lossless handover.

12. The method according to claim 2 characterized in that a mobile station buffers one or more uplink N-PDUs which have been confirmed according to RLC.

13. The method according to claim 2 characterized in that uplink and downlink G-PDU sequence numbers associated with uplink and downlink N-PDUs are recorded while in unacknowledged mode between the mobile station and the support node.

14. The method according to claim 1 characterized in that the base station change allows an entire data transfer session in unacknowledged mode.

15. The method according to claim 14 characterized in that the data transfer session is a session of data file transfer.

16. The method according to claim 1 characterized in that the packet switched communications in unacknowledged mode between the mobile station and the support node concerns unacknowledged mode of LLC protocol.

17. The method according to claim 1 comprising a mode of operation characterized by recording one or more sequence numbers of one or more protocol data units in both uplink and downlink.

18. The method according to claim 17 characterized in that the protocol data units are N-PDUs.

19. The method according to claim 17 characterized in that the protocol data units are G-PDUs.

20. The method according to claim 1 characterized in that SNDCP sequence continuity is maintained across a support node involved in packet switched base station change.

21. The method according to claim 1 characterized in that one or more SN-UNITDATA protocol data unit includes one or more N-PDU.

22. The method according to claim 21 characterized in that N-PDU number is included in a header of SN-UNITDATA protocol data unit.

23. The method according to claim 1 characterized in that a support node connected to a source base station or base station subsystem to be changed informs a mobile station, also connected to the base station or base station subsystem, on a next expected uplink protocol data unit to be received.

24. The method according to claim 1 characterized in that a mobile station connected to a source base station or base station subsystem to be changed informs a source support node, also connected to the base station or base station subsystem, on a next expected downlink protocol data unit to be received.

25. The method according to claim 23 or 24 characterized in that the base station or base station subsystem relays the information between mobile station and support node with no required processing of the information.

26. The method according to any of claims 23-25 characterized in that the source base station or base station subsystem is allowed to continue receiving uplink data while emptying downlink buffers as a response to a PS Handover Command.

27. The method according to any of claims 1-26 characterized in that the protocol data units are compliant with Sub-Network Dependent Convergence Protocol.

28. The method according to claim 27 characterized in that SNDCP entities in a source support node buffers one or more downlink N-PDUs.

29. The method according to claim 28 characterized in that the source support node buffers a number of N-PDUs corresponding to the delay attribute of the associated packet flow.

30. The method according to claim 29 characterized in that the buffered N-PDUs are forwarded to a target support node during the base station change.

31. The method according to claim 30 characterized in that the received forwarded N-PDUs in target support node are forwarded to the mobile station.

32. The method according to claim 31 characterized in that the one or more N-PDUs are forwarded to the mobile station when the support node has received a PS Handover Complete message.

33. The method according to claim 27 characterized in that one or more downlink N-PDUs are buffered in SNDCP entities in a target support node.

34. The method according to claim 33 characterized in that the target support node buffers a number of uplink N-PDUs corresponding to the number of N-PDUs received from the source support node.

35. The method according to claim 27 characterized in that one or more uplink N-PDUs are buffered in SNDCP entities in a mobile station.

36. The method according to claim 35 characterized in that the mobile station buffers a number of

N-PDUs corresponding to the maximum delay of RLC/MAC acknowledgement of transmission of LLC PDU.

37. A mobile station for packet switched communications communicating over a communications network including base stations and one or more support nodes, the mobile station characterized by processing means operating according to one or more protocols receiving protocol data units, the processing means extracting information for the mobile station to inform the network of next expected downlink protocol data unit in association with packet switched base station change allowing lossless base station change of packet switched communications.

38. A mobile station for packet switched communications communicating over a communications network including base stations and one or more support nodes, the mobile station characterized by processing means operating according to one or more protocols transferring protocol data units and receiver receiving informing from the network on next expected uplink protocol data unit in association with packet switched base station change allowing lossless base station change of packet switched communications.

39. The mobile station according to claim 37 or 38 characterized in that the protocol data units are compliant with Sub-Network Dependent Convergence Protocol.

40. The mobile station according to claim 39 characterized by a buffer for buffering one or more uplink N-PDUs which have been confirmed according to RLC.

41. The mobile station according to claim 40 characterized in that the mobile station starts

uplink transmission upon handover to a target cell, by transmitting an estimated next uplink N-PDU that was not acknowledged by lower layers in a source cell from which the mobile station was handed over to the target cell.

42. The mobile station according to claim 41 characterized by the processing means recording according to the Sub-Network Dependent Convergence Protocol N-PDU sequence numbers of N-PDUs received or transferred.

43. The mobile station according to claim 39 or 40 characterized by protocol data units including N-PDUs.

44. The mobile station according to any of claims 41-43 characterized by buffer means, buffering uplink N-PDUs

45. The mobile station according to claim 44 characterized in that the buffer size is sufficiently large for a number of N-PDUs corresponding to the maximum delay of RLC/MAC acknowledgement of transmission of LLC PDU to be buffered.

46. The mobile station according to any of claims 39-43 characterized in that the information on next expected protocol data unit is transferred in a message initiating or completing a change of base station or handover as regards the mobile station.

47. The mobile station according to claim 46 characterized in that the message initiating or completing a change of base station or handover is a PS Handover Command or PS Handover Complete message.

48. A support node in a packet switched communications network comprising base stations for communications involv-

ing at least one mobile station, the support node characterized by processing means operating according to one or more protocols receiving protocol data units, the processing means extracting information for the support node to inform a mobile station of next expected uplink protocol data unit in association with packet switched base station change of the at least one mobile station.

49. A support node in a packet switched communications network comprising base stations for communications involving at least one mobile station, the support node characterized by processing means operating according to one or more protocols transferring protocol data units and receiver receiving informing from the at least one mobile station on next expected downlink protocol data unit in association with packet switched handover allowing lossless base station change of packet switched communications.

50. The support node according to claim 49 characterized by a protocol entity for maintaing N-PDU send and receive sequence numbers, and GTP T-PDU uplink and downlink sequence numbers for each packet flow subject to base station change of lossless type, the support node acting as source support node during the base station change, forwarding maintained sequence number information to a target support node of the base station change.

51. The support node according to claim 50 characterized by processing means for providing downlink N-PDU and downlink GTP T-PDU sequence numbers along with each N-PDU forwarded to the target support node.

52. The support node according to claim 50 characterized by a buffer for buffering a set of N-PDUs

sent down to the source BSS for each packet flow subject to lossless PS handover.

53. The support node according to claim 50 characterized by processing means for including an RLC ACK/NACK report in a PS handover command message, allowing a mobile station to determine which one or more N-PDUs have been completely received by the network.

54. The support node according to claim 50 characterized in that a PS handover command sent from the support node to a source BSS includes expected Receive N-PDU sequence number, at which a mobile station should start transmission in a target cell for each uplink packet flow subject to lossless handover.

55. The support node according to claim 50 characterized by recording means for recording uplink and downlink G-PDU sequence numbers associated with uplink and downlink N-PDUs while in unacknowledged mode between the mobile station and the support node.

56. The support node according to claim 49 characterized in that the base station change is within GERAN or between GERAN and UTRAN.

57. The support node according to claim 49 characterized in that a protocol entity of the support node maintains sequence continuity over the support node.

58. The support node according to claim 57 characterized in that the protocol entity operates according to SNDCP.

59. The support node according to claim 49 characterized in that upon completion of a packet switched base station change, the support node sustaining

the base station changed to starts transmissions of protocol data units to the at least one mobile station at the next protocol data unit expected by the at least one mobile station.

60. The support node according to claim 59 characterized by receive means, the transmissions being started upon the receive means receiving a PS Handover Complete message.

61. The support node according to any of claims 48-60 characterized in that the protocol data units are compliant with Sub-Network Dependent Convergence Protocol.

62. The support node according to claim 61 characterized by the processing means recording according to the Sub-Network Dependent Convergence Protocol N-PDU sequence numbers of N-PDUs received or transferred.

63. The support node according to claim 61 characterized by the processing means recording according to the Sub-Network Dependent Convergence Protocol G-PDU sequence numbers of G-PDUs received or transferred.

64. The support node according to any of claims 61-63 characterized by buffer means, buffering downlink N-PDUs

65. The support node according to claim 64 characterized in that the buffer size is sufficiently large for a number of N-PDUs corresponding to a delay attribute of the associated packet flow.

66. The support node according to any of claims 48-65 characterized in that the information on next expected protocol data unit is transferred in a mes-

sage initiating or completing a change of base station or handover as regards the at least one mobile station.

67. The support node according to claim 66 characterized in that the message initiating or completing a change of base station or handover is a PS Handover Command or PS Handover Complete message.

68. The support node according to claim 64 or 65 characterized in that the buffered protocol data units are transferred upon packet switched base station change to a support node sustaining packet switched communications over the base station to which the at least one mobile station changed.

69. The support node according to claim 68 characterized in that the buffered protocol data units are transferred upon completion of a preparation phase of the packet switched base station change.

70. The support node according to any of claims 48-69 characterized in that the support not is a Serving GPRS Support Node.

71. A base station entity in a packet switched communications network comprising at least one support node for communications involving at least one mobile station, the base station entity characterized by receive means, transmit means and buffer means, the buffer means buffering downlink protocol data units, the buffer means being emptied of protocol data units destined for the at least one mobile station, the protocol data units being transmitted by the transmit means upon the receive means receiving a command of packet switched base station change, as regards the one mobile station, from the at least one support node.

72. The base station entity according to claim 71 characterized by processing means for deleting buffered LLC data that has not been sent to, or acknowledged by, the mobile station at the point in time when the source BSS sends the PS handover command message to the mobile station.

73. The base station entity according to claim 72 characterized by sending means for sending a status message back to the source support node telling it how many LLC PDUs have been deteted.

74. The base station entity according to claim 73 characterized in that the status message provides part of the one or more deleted LLC PDUs.

75. The base station entity according to claim 74 characterized in that the status message provides the header of the one or more deleted LLC PDUs.

76. The base station entity according to claim 71 characterized by receive means and transmit means, the receive means receiving uplink packet data from the at least one mobile station while the buffer means being emptied of protocol data units destined for the at least one mobile station.

77. A communications system characterized by means for carrying out the method in any of claims 1-37.

78. A communications system characterized by a plurality of mobile stations in any of claims 38-48, the mobile stations being capable of reciprocal packet switched communications.

79. A communications system characterized by a plurality of support nodes in any of claims 49-70.

80. A communications system characterized by a plurality of base station entities in any of claims 71-76.